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EXAMINER	
QUAN, ELIZABETH S	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/619,416	Applicant(s) ERDEN ET AL.	
	Examiner Elizabeth Quan	Art Unit 1743	

-- Th MAILING DATE of this communication appears on the cov r sh et with the correspond nce address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-51* is/are pending in the application.

4a) Of the above claim(s) *38-41* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-37 and 42-51* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *1-51* are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☒ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

   I. Claims 1-37 and 42-51, drawn to the apparatus of a high pressure parallel reactor for synthesis and screening of materials, classified in class 422, subclass 130.

   II. Claims 38-41, drawn to the method of reacting materials in parallel within the high pressure parallel reactor, classified in class 436, subclass 174.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions II and I are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the process as claimed can be practiced by another and materially different apparatus such as a chemical synthesizer with perforations on the lower ends of the reaction wells.

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

4. During a telephone conversation with Cindy S. Kaplan on 10/26/2001 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-37 and 42-51. Affirmation of this election must be made by applicant in

replying to this Office action. Claims 38-41 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a petition under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Oath/Declaration

6. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

> The oath or declaration is defective because:
> Non-initialed and/or non-dated alterations have been made to the oath or declaration. See 37 CFR 1.52(c).

Drawings

7. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: (82). Reference number (82) is shown in Figure 8. Correction is required.

8. Applicant is required to submit a proposed drawing correction in reply to this Office action. However, formal correction of the noted defect can be deferred until the application is allowed by the examiner.

Specification

9. The abstract of the disclosure is objected to because "an apparatus for use in parallel reaction of materials" is a fragment. Possible modifications are: The invention

relates to an apparatus for use in parallel reaction of materials. An apparatus for use in parallel reaction of materials is provided. Correction is required. See MPEP § 608.01(b).

10. The disclosure is objected to because of the following informalities: On page 11, line 11 "choride" should be "chloride". Appropriate correction is required.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

13. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

14. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

15. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,309,608 to Zhou et al.

Referring to claim 1, Zhou et al. disclose an apparatus for synthesis of organic compounds (see ABSTRACT; FIG. 1). A reaction block assembly (100) contains reaction vessels with an open upper end for receiving reagents and solvents (see COL. 7, lines 39-42; COL. 16, lines 25-29). An O-ring or gasket lines the perimeters of the reaction block (100) and cover plate (200) to allow sealing engagement between the top surface of the reaction block and the bottom surface of the cover plate (see COL. 14, lines 66 and 67; COL. 15, lines 1-7). Gas inlet ports may be located on the baseplate (300), washplate (600), and coverplate (200) (see COL. 20, lines 24-44). A small space or gap located between the top surface of the reaction block (100) and bottom surface of the cover plate (200) permits fluid communication between the gas and vapor space and reaction chambers (110), facilitating pressure equalization above, below, and within the chambers (see COL. 15, lines 56-67; COL. 16, lines 1-7). Clamping or closure means, typically screw or bolt-type fasteners passing through through-holes, provide an effective seal between the cover plate and reaction block to allow internal reaction block pressures as high as several atmospheres (see COL. 15, lines 21-32). Zhou et al. differ from the claimed invention because the reaction vessels have drain holes, which are closed and opened during and after a reaction, respectively, by a sliding seal plate (400) to control drainage of wastes to simplify

washings between reactions. The applicant does not address the issue of emptying the contents of the wells after a reaction. Since the applicant has not indicated that whether the reaction vessel was originally fabricated with a closed lower end or an aperture later sealed during a reaction is a patentable limitation, the examiner takes Official Notice of the fact that a reaction vessel with a closed lower end or an aperture sealed during a reaction are equivalents in the art and do not affect the operation of the reactor. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute a reaction vessel originally made with a closed lower end with a reaction vessel with an aperture sealed during a reaction disclosed by Zhou et al. because of their functional equivalents in the art, further affording the advantage of draining the contents of the vessels after a reaction.

16. Claims 2-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,309,608 to Zhou et al. in view of WO 01/00315 A2 to Van Den Brink et al.

Referring to claims 2-4, Zhou et al. do not quantify internal pressures within the reactor. Van Den Brink et al. disclose a reactor vessel array, operating at pressures in the range from 0 to 200 bar, which the maximum in the range is equivalent to 2901 psi (see COL. 11, lines 19-21; http://www.onlineconversion.com). The invention of Van Den Brink et al. address the issue of carrying out operations under elevated pressures and/or handling reactive materials at elevated pressures. It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the synthesis apparatus disclosed by Zhou et al. to allow operating pressures greater

than 1000 psig as necessary for particular operations and reactants in view of Van Den Brink et al.

17. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,309,608 to Zhou et al. in view of U.S. Patent No. 3,617,033 to Ichikawa et al.

Referring to claim 5, Zhou et al. do not specifically state titanium as a material for reactor construction. Ichikawa et al. disclose an experiment using a titanium pressure vessel (see COL. 8, lines 6). While Ichikawa et al. do not explicitly state why the pressure vessel is made from titanium, it appears titanium can withstand high pressures and is corrosion resistant. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the synthesis apparatus disclosed by Zhou et al. from titanium for the advantages of withstanding high pressures and corrosion resistance.

18. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,309,608 to Zhou et al.

Referring to claims 6 and 7, Zhou et al. disclose using stainless steel and aluminum alloys for the reaction block (see COL. 11, lines 36-46). Zhou et al. does not address the cover; however, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the cover disclosed by Zhou et al. from stainless steel or aluminum alloys matching the base.

19. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,309,608 to Zhou et al. in view of U.S. Patent No. 5,529,756 to Brennan et al.

Referring to claim 8, Zhou et al. do not disclose a quick release fitting coupled to the inlet port. Brennan et al disclose an inlet tube (72) coupled to the gas inlet (70) for connecting the latter with a gas source to provide a positive pressure within the pressure chamber without introducing oxygen from the environment (see FIG. 5; COL. 46-50). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include an inlet tube as disclosed by Brennan et al. coupled to the gas inlet of the apparatus of Zhou et al. to provide a positive pressure in the chamber without introducing oxygen from the environment.

20. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,309,608 to Zhou et al. in view of U.S. Patent No. 5,529,756 to Brennan et al.

Referring to claim 9, Zhou et al. disclose venting the reaction block through a pressure relief valve (see COL. 21, lines 37-40). Furthermore, pressure-control means are provided in the purge gas exit line to control the pressure within the reaction block to avoid pressure buildup and safety hazards (see COL. 21, lines 41-44). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a pressure relief valve to an outlet port in communication with the pressure chamber to avoid pressure buildup and the associated hazards.

21. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,309,608 to Zhou et al.

Referring to claim 10, Zhou et al. disclose loading the reactants into individual vessels prior to placing the cover plate onto the block (see COL. 14,

lines 60-63). A seal between the cover plate and reaction block is achieved by typically an O-ring or gasket (see COL. 14, lines 66 and 67; COL. 15, lines 1-3). Furthermore, clamping or closure means reinforce the seal to provide a high-pressure environment (see COL. 15, lines 21-32). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have a removably attached cover to facilitate loading of reactants and creating a high-pressure environment.

22. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,309,608 to Zhou et al.

Referring to claim 11, Zhou et al. disclose semi-automated or automated resin washing and reactant dispensing to selected reaction vessels within a standard microtiter plate with a footprint of 3-3/8" by 5" to enhance productivity of all phases of combinatorial synthesis (see COL. 10, lines 19-21; COL. 26, lines 20-56; COL. 27, lines 1-7). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to standardize the dimensions of the synthesis apparatus to allow automation.

23. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,309,608 to Zhou et al.

Referring to claim 12, Zhou et al. disclose transferring synthesized compounds in the first and second of a pair of 48-vessel reaction blocks to odd-numbered and even-numbered wells, respectively, to fill 96 wells (see COL. 58-64; FIG. 17A and 17B). Furthermore, it is well known in the art to use plates with 96 wells in a 12 by 8 array. Therefore, it would have been obvious to one having

ordinary skill in the art at the time the invention was made to use a plate with 96 wells in a 12 by 8 array because of convention.

24. Claims 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,309,608 to Zhou et al. in view of U.S. Patent No. 6,171,555 to Cargill et al.

Referring to claims 13, Zhou et al. do not quantify the internal volume of the wells. Cargill et al. disclose each reaction chamber having an internal volume of approximately 2 ml. While Cargill et al. do not explicitly state why an internal volume of approximately 2 ml is used for each reaction chamber, the examiner takes Official Notice of the fact that wells with an internal volume of approximately 2 ml is conventional in the art. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to create wells with an internal volume of approximately 2 ml as disclosed by Cargill et al. because of set standards in the art.

25. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,309,608 to Zhou et al. in view of U.S. Patent No. 6,027,694 to Boulton et al. and U.S. Patent No. 6,264,891 to Heynaker et al.

Referring to claim 14, Zhou et al cite reaction blocks generally have from 12 to 96 or more reaction chambers (see COL. 10, lines 16-18). Boulton et al. disclose microplates with lower density wells are available as needed for the number of assays performed (see COL. 1, lines 53-57). While Boulton et al. and Zhou et al. do not mention the configuration of the wells, Heynaker et al. leave the option of array configuration of wells open (see COL. 6, lines 57-63). Heynaker et al. do not explicitly state why different arrays are used; however, it

appears that configuration may be important for automation. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use 12 wells for completing lesser than or equal to 12 reactions in a 3 by 4 array to conform to automation equipment.

Referring to claim 15, Zhou et al. do not quantify the internal volume of the wells. Applying the decision made by the Federal Circuit in Gardner v. TEC Systems, Inc., the dimensions of the well would not affect the performance of the claimed device respective to prior art device. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the internal volume of the wells as necessary to produce the desired amount of product. Therefore, the claimed device is not patentably distinct from prior art device based on the internal volume of the wells.

26. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,309,608 to Zhou et al.

Referring to claim 16, Zhou et al. disclose center-to-center spacing of wells in a standard 96-well plate to be about 9 mm (see COL. 28, lines 63-67; COL. 29, lines 1-3). Additionally, it is well known in the art to have 9 mm center-to-center spacing in a 96-well plate. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use 9 mm center-to-center spacing among wells to conform standards and allow automation configured to such standards.

27. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,309,608 to Zhou et al.

Referring to claim 17, Zhou et al. disclose a perforated cover plate bottom piece (960) adjacent the reaction block (100) containing reaction vessels (see FIG. 18A and 18B). The cover plate bottom piece (960) is part of a three-component perforated cover plate assembly (900) with the septum sheet (940) sandwiched between the cover plate bottom and top piece (920) (see COL. 16, lines 36-60). A perforated septum sheet (940) with through-hole (942) may be used to access the reaction vessels while purging the reaction block with a gas (see COL. 17, lines 14-17). The septum sheet (940) allows dispensation of reactants into vessels without cross-contamination and exposure to the atmosphere (see COL. 16, lines 8-12). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a flow restriction device adjacent to the reaction wells to provide communication between pressure chamber and wells and prevent cross-contamination between wells.

28. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,309,608 to Zhou et al.

Referring to claim 18, Zhou et al. disclose perforations extending through cover plate bottom and top piece (920, 960) are vertically aligned with one another and the centers of the reaction vessels underneath them for the purposes of delivering reactants (see COL. 16, lines 40-48). Additionally, the septum sheet (940) may also be perforated (see COL. 17, lines 16 and 17). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a flow restriction device with apertures aligned with reaction wells to deliver reactants.

29. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,309,608 to Zhou et al. as applied in claim 17 in further view of U.S. Patent No. 4,000,492 to Willens.

Referring to claim 19, Zhou et al. do not disclose a flow restriction device with micromachined holes aligned with reaction wells. Willens disclose laser micromachining holes (see COL. 2, line 5). Furthermore, holes can be formed in parallel rows with centers of the holes equally spaced along each row from row to row with the diameter of the largest holes equal to the center-to-center spacing of the holes (see COL. 1, lines 32-35). It appears that micromachining provides more precise holes than other measures. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use micromachined holes in the flow restriction device of Zhou et al. to provide precise holes with respect to spacing and size to insure alignment of the flow restriction device with reaction wells.

30. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,309,608 to Zhou et al. in view of U.S. Patent No. 5,443,791 to Cathcart et al.

Referring to claim 20, Zhou et al. disclose a three-component perforated cover plate assembly (900) comprising of perforated cover plate top and bottom pieces (920, 960) with a septum sheet (940) sandwiched in between to deliver reagents under a closed system (see COL. 16, lines 36-60). Zhou et al. do not explicitly state check valves aligned with reaction wells to permit and restrict flow into wells. Cathcart et al. disclose a duck-billed closure (253) assembled to a tube (255) located in the storage stations of the automated laboratory (11) (see

ABSTRACT; COL. 18, lines 60 and 61). A needle-like device may be inserted or withdrawn from above to allow flow or restrict flow into the tube, respectively. Furthermore, the duck-bill closure minimizes evaporation and prevents contamination (see COL. 19, lines 39-44; ABSTRACT). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have check valves aligned with the wells to allow or restrict flow into the wells and restrict flow from the wells into the pressure chamber while minimizing evaporation and preventing contamination.

31. Claims 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,309,608 to Zhou et al.

Referring to claims 21-23, Zhou et al. an elastomeric, solvent-resistant septum sheet, such as a rectangular rubber sheet (see COL. 16, lines13-15). The septum sheet may be perforated, lending itself porous (see COL. 17, line 16). These characteristics allow delivery of reactants without exposure to the environment and cross-contamination. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a rigid elastomeric, porous sheet for a flow restriction device.

32. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,309,608 to Zhou et al.

The three-component perforated cover plate assembly (900) are held in place atop the reaction block (100) with closure means, such as threaded fasteners, that extend through through-holes (922, 962) in the perforated cover plate top and bottom pieces (920, 960), where closure means ensure high internal

reaction block pressures and prevent exposure to the environment and cross-contamination (see COL. 16, lines 49-60; FIG. 18A and 18B). It appears the removable aspect of the flow restriction device allows flexibility for using different septum sheets, such as perforated or non-perforated, depending on the reaction (see COL. 17, line 16). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a removable flow restriction device for flexibility and include fastening means to preserve reaction block pressures and prevent cross-talk and exposure to the environment.

33. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,309,608 to Zhou et al.

Referring to claim 25, Zhou et al. disclose an internal cavity (888) of a transfer box base (880) that could hold a deepwell or another type of receiving element, such as a microtiter plate (see COL. 27, lines 12-15; FIG. 17A and 17B). The internal cavity could hold an array of glass vials (see COL. 27, lines 15-17). It appears that use of vials or not in wells is based on preference and type of reaction. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use vials within wells as preferred or necessary for particular reactions.

34. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,309,608 to Zhou et al.

Referring to claim 26, Zhou et al. disclose the septum sheet (940) seals the top edges of the individual reaction vessels, which are placed on top of the seal

plate (400) (see COL. 16, lines 17-19). The seal plate (400) is pressed against reaction vessel O-ring seals (460) by springs (490) to relieve reaction vessel pressures when necessary (see COL. 58-60; FIG. 1 and 5A-5F). Excessive reaction pressures will cause downward motion of the seal plate (400) until the gap between the bottom surface of the reaction block (100) and top surface of the seal plate (400) becomes to great for the O-rings to seals (460) to close, and fluid will leak from the vessels through the gap (see COL. 60-67). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have springs bias reaction vessels against the flow restriction device to impose an effective seal yet relieve excess pressure when necessary.

35. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,309,608 to Zhou et al.

Referring to claim 27, Zhou et al. disclose the top seal between reaction block (100) and reaction block cover plate (200) through a single cover plate seal (210) by an O-ring that runs along the perimeters of the cover plate and reaction block (see COL. 14, lines 66 and 67; COL. 15, lines 1-3; FIG. 1). An O-ring groove (240) is provided for the O-ring either in the top surface of the reaction block (100) or bottom surface of cover plate (200) (see COL. 7-12; FIG 8B). Furthermore, a recess (244) may be cut into the underside of cover plate (200). Since the top of the reaction block (100) is slightly smaller than the recessed area, the reaction block just fits into the area to help position the cover plate on the reaction block (see COL. 12-18; FIG. 8B). Therefore, it would have been obvious to one having ordinary skill in the art to include a groove in the base or cover to

fit the gasket within it to provide an effective seal and help locate the cover plate on the reaction block.

36. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,309,608 to Zhou et al.

Referring to claim 28, Zhou et al. disclose a reaction base plate (300) with a recessed area (350) to contain the sliding seal plate (400) and reaction block (100) (see COL. 17, lines 53-61; FIG. 1 and 9). A portion of the reaction base plate (300) extends beyond the sliding seal plate (400) and reaction block (100), where reaction block closure posts (320) receive fasteners through through-holes (230) on the edge of the cover plate (200) to effect a tight seal (see COL. 15, lines 27). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to include periphery flanges with through-holes and closure posts to effect a tight seal between the base and cover.

37. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,309,608 to Zhou et al.

Referring to claim 29, Zhou et al. disclose an internal cavity (888) of a transfer box base (880) that could hold a deepwell or another type of receiving element, such as a microtiter plate (see COL. 27, lines 12-15; FIG. 17A and 17B). The internal cavity could hold an array of glass vials (see COL. 27, lines 15-17). It appears that use of vials or not in wells is based on preference and type of reaction. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use vials within wells as preferred or necessary for particular reactions.

38. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,309,608 to Zhou et al.

Referring to claim 30, Zhou et al. do not quantify the volume of the pressure chamber. The Federal Circuit decided in Gardener v. TEC System, Inc. that difference of dimensions between prior art and claims would not make the claimed device perform differently than prior art device, and the claimed device is not patentably distinct from the prior art device. Furthermore, the applicant has not stated how a pressure chamber volume of 10 cubic inches solves any problems or is for any particular purpose. It appears that the synthesis apparatus would perform equally well with any pressure chamber volume. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use different pressure chamber volumes as necessary or desired for performing assays.

39. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,309,608 to Zhou et al.

Referring to claim 31, Zhou et al. disclose an apparatus for synthesis of organic compounds (see ABSTRACT). A reaction block (100) is sized to receive a standard microtiter plate containing 12 to 96 or more reaction chambers with upper open ends that receive reactants and are exposed to the pressure chamber (see COL. 10, lines 16-19; COL. 15, lines 28-32; COL. 16, lines 25-29; COL. 17, lines 14-17). Fasteners (220), which pass through through-holes (230) in the cover plate (200), are used to position and pull the cover plate (200) upon the reaction block (100) after receiving the microtiter plate to provide an effective

seal for internal block pressures as high as several atmospheres (see COL.10, lines 18-20; COL. 15, lines 14-18 and 21-27; COL. 15, lines 21-32; FIG. 1). A small space or gap located between the top surface of the reaction block (100) and bottom surface of the cover plate (200) permits fluid communication between the gas and vapor space and reaction chambers (110), facilitating pressure equalization above, below, and within the chambers (see COL. 15, lines 56-67; COL. 16, lines 1-7). A perforated septum sheet (940) further allows purging of the reaction block (100) with a gas (see COL. 17, lines 14-17). Zhou et al. differ from the claimed invention because the reaction vessels have drain holes, which are closed and opened during and after a reaction, respectively, by a sliding seal plate (400) to control drainage of wastes to simplify washings between reactions. The applicant does not address the issue of emptying the contents of the wells after a reaction. Since the applicant has not indicated that whether the reaction vessel was originally fabricated with a closed lower end or an aperture later sealed during a reaction is a patentable limitation, the examiner takes Official Notice of the fact that a reaction vessel with a closed lower end or an aperture sealed during a reaction are equivalents in the art and do not affect the operation of the reactor.

40. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,309,608 to Zhou et al. in view of U.S. Patent No. 4,180,943 to Smith et al. in further view of U.S. Patent No. 6,250,707 to Dinter et al.

Referring to claim 32, Zhou et al. do not disclose a four bar mechanism for fastening the cover onto the reaction block. Smith et al disclose a four bar mechanism for an aircraft door, which forces the latch operation to be performed

in correct order (see COL. 1, lines 29-38). Additionally, Dinter et al. disclose further advantages of simple, reliable mechanism with low production cost, high precision, and good functionality (see COL. 1, lines 51 and 52; COL. 2, lines 4-6). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a four bar mechanism as fastening means for a cover onto the reaction block for the apparatus of Zhou et al. for advantages of simple, reliable mechanism with low production cost, high precision, and good functionality.

41. Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,309,608 to Zhou et al.

Referring to claim 33, Zhou et al. disclose a perforated cover plate bottom piece (960) adjacent the reaction block (100) containing reaction vessels (see FIG. 18A and 18B). The cover plate bottom piece (960) is part of a three-component perforated cover plate assembly (900) with the septum sheet (940) sandwiched between the cover plate bottom and top piece (920) (see COL. 16, lines 36-60). A perforated septum sheet (940) with through-hole (942) may be used to access the reaction vessels while purging the reaction block with a gas (see COL. 17, lines 14-17). The septum sheet (940) allows dispensation of reactants into vessels without cross-contamination and exposure to the atmosphere (see COL. 16, lines 8-12). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a flow restriction device adjacent to the reaction wells to provide communication between pressure chamber and wells and prevent cross-contamination between wells.

42. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,309,608 to Zhou et al.

Referring to claim 34, Zhou et al. disclose perforations extending through cover plate bottom and top piece (920, 960) are vertically aligned with one another and the centers of the reaction vessels underneath them for the purposes of delivering reactants (see COL. 16, lines 40-48). Additionally, the septum sheet (940) may also be perforated (see COL. 17, lines 16 and 17). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a flow restriction device with apertures aligned with reaction wells to deliver reactants.

43. Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,309,608 to Zhou et al. as applied in claim 33 in further view of U.S. Patent No. 4,000,492 to Willens.

Referring to claim 35, Zhou et al. do not disclose a flow restriction device with micromachined holes aligned with reaction wells. Willens disclose laser micromachining holes (see COL. 2, line 5). Furthermore, holes can be formed in parallel rows with centers of the holes equally spaced along each row from row to row with the diameter of the largest holes equal to the center-to-center spacing of the holes (see COL. 1, lines 32-35). It appears that micromachining provides more precise holes than other measures. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use micromachined holes in the flow restriction device of Zhou et al. to provide

precise holes with respect to spacing and size to insure alignment of the flow restriction device with reaction wells.

44. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,309,608 to Zhou et al. in view of U.S. Patent No. 5,443,791 to Cathcart et al.

Referring to claim 36, Zhou et al. disclose a three-component perforated cover plate assembly (900) comprising of perforated cover plate top and bottom pieces (920, 960) with a septum sheet (940) sandwiched in between to deliver reagents under a closed system (see COL. 16, lines 36-60). Zhou et al. do not explicitly state check valves aligned with reaction wells to permit and restrict flow into wells. Cathcart et al. disclose a duck-billed closure (253) assembled to a tube (255) located in the storage stations of the automated laboratory (11) (see ABSTRACT; COL. 18, lines 60 and 61). A needle-like device may be inserted or withdrawn from above to allow flow or restrict flow into the tube, respectively. Furthermore, the duck-bill closure minimizes evaporation and prevents contamination (see COL. 19, lines 39-44; ABSTRACT). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have check valves aligned with the wells to allow or restrict flow into the wells and restrict flow from the wells into the pressure chamber while minimizing evaporation and preventing contamination.

45. Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,309,608 to Zhou et al.

Referring to claim 37, Zhou et al. disclose an internal cavity (888) of a transfer box base (880) that could hold a deepwell or another type of receiving

element, such as a microtiter plate (see COL. 27, lines 12-15; FIG. 17A and 17B). The internal cavity could hold an array of glass vials (see COL. 27, lines 15-17). It appears that use of vials or not in wells is based on preference and type of reaction. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use vials within wells as preferred or necessary for particular reactions.

46. Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,309,608 to Zhou et al.

Referring to claim 42, Zhou et al. disclose an apparatus for synthesis of organic compounds (see ABSTRACT; FIG. 1). A reaction block assembly (100) contains reaction vessels with an open upper end for receiving reagents and solvents (see COL. 7, lines 39-42; COL. 16, lines 25-29). An O-ring or gasket lines the perimeters of the reaction block (100) and cover plate (200) to allow sealing engagement between the top surface of the reaction block and the bottom surface of the cover plate (see COL. 14, lines 66 and 67; COL. 15, lines 1-7). Gas inlet ports may be located on the baseplate (300), washplate (600), and coverplate (200) (see COL. 20, lines 24-44). A small space or gap located between the top surface of the reaction block (100) and bottom surface of the cover plate (200) permits fluid communication between the gas and vapor space and reaction chambers (110), facilitating pressure equalization above, below, and within the chambers (see COL. 15, lines 56-67; COL. 16, lines 1-7). A perforated cover plate bottom piece (960) adjacent the reaction block (100) contains reaction vessels (see FIG. 18A and 18B). The cover plate bottom piece (960) is part of a

three-component perforated cover plate assembly (900) with the septum sheet (940) sandwiched between the cover plate bottom and top piece (920) (see COL. 16, lines 36-60). A perforated septum sheet (940) with through-hole (942) may be used to access the reaction vessels while purging the reaction block with a gas (see COL. 17, lines 14-17). The septum sheet (940) allows dispensation of reactants into vessels without cross-contamination and exposure to the atmosphere (see COL. 16, lines 8-12). Zhou et al. differ from the claimed invention because the reaction vessels have drain holes, which are closed and opened during and after a reaction, respectively, by a sliding seal plate (400) to control drainage of wastes to simplify washings between reactions. The applicant does not address the issue of emptying the contents of the wells after a reaction. Since the applicant has not indicated that whether the reaction vessel was originally fabricated with a closed lower end or an aperture later sealed during a reaction is a patentable limitation, the examiner takes Official Notice of the fact that a reaction vessel with a closed lower end or an aperture sealed during a reaction are equivalents in the art and do not affect the operation of the reactor. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute a reaction vessel originally made with a closed lower end with a reaction vessel with an aperture sealed during a reaction disclosed by Zhou et al. because of their functional equivalents in the art, further affording the advantage of draining the contents of the vessels after a reaction.

47. Claims 43-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,309,608 to Zhou et al.

Referring to claims 43-45, Zhou et al. disclose an elastomeric, solvent-resistant septum sheet, such as a rectangular rubber sheet (see COL. 16, lines13-15). The septum sheet may be perforated, lending itself porous (see COL. 17, line 16). These characteristics allow delivery of reactants without exposure to the environment and cross-contamination. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a rigid elastomeric, porous sheet for a flow restriction device.

48. Claim 46 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,309,608 to Zhou et al.

Referring to claim 46, Zhou et al. disclose perforations extending through cover plate bottom and top piece (920, 960) are vertically aligned with one another and the centers of the reaction vessels underneath them for the purposes of delivering reactants (see COL. 16, lines 40-48). Additionally, the septum sheet (940) may also be perforated (see COL. 17, lines 16 and 17). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a flow restriction device with apertures aligned with reaction wells to deliver reactants.

49. Claim 47 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,309,608 to Zhou et al. as applied in claim 42 in further view of U.S. Patent No. 4,000,492 to Willens.

Referring to claim 47, Zhou et al. do not disclose a flow restriction device with micromachined holes aligned with reaction wells. Willens disclose laser micromachining holes (see COL. 2, line 5). Furthermore, holes can be formed in

parallel rows with centers of the holes equally spaced along each row from row to row with the diameter of the largest holes equal to the center-to-center spacing of the holes (see COL. 1, lines 32-35). It appears that micromachining provides more precise holes than other measures. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use micromachined holes in the flow restriction device of Zhou et al. to provide precise holes with respect to spacing and size to insure alignment of the flow restriction device with reaction wells.

50. Claim 48 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,309,608 to Zhou et al. in view of U.S. Patent No. 5,443,791 to Cathcart et al.

Referring to claim 48, Zhou et al. disclose a three-component perforated cover plate assembly (900) comprising of perforated cover plate top and bottom pieces (920, 960) with a septum sheet (940) sandwiched in between to deliver reagents under a closed system (see COL. 16, lines 36-60). Zhou et al. do not explicitly state check valves aligned with reaction wells to permit and restrict flow into wells. Cathcart et al. disclose a duck-billed closure (253) assembled to a tube (255) located in the storage stations of the automated laboratory (11) (see ABSTRACT; COL. 18, lines 60 and 61). A needle-like device may be inserted or withdrawn from above to allow flow or restrict flow into the tube, respectively. Furthermore, the duck-bill closure minimizes evaporation and prevents contamination (see COL. 19, lines 39-44; ABSTRACT). Therefore, it would was made to have check valves aligned with the wells to allow or restrict flow into the

wells and restrict flow from the wells into the pressure chamber while minimizing evaporation and preventing contamination.

51. Claim 49 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,309,608 to Zhou et al.

Referring to claim 49, Zhou et al. disclose an internal cavity (888) of a transfer box base (880) that could hold a deepwell or another type of receiving element, such as a microtiter plate (see COL. 27, lines 12-15; FIG. 17A and 17B). The internal cavity could hold an array of glass vials (see COL. 27, lines 15-17). It appears that use of vials or not in wells is based on preference and type of reaction. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use vials within wells as preferred or necessary for particular reactions.

52. Claim 50 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,309,608 to Zhou et al.

Referring to claim 50, Zhou et al. disclose the septum sheet (940) seals the top edges of the individual reaction vessels, which are placed on top of the seal plate (400) (see COL. 16, lines 17-19). The seal plate (400) is pressed against reaction vessel O-ring seals (460) by springs (490) to relieve reaction vessel pressures when necessary (see COL. 58-60; FIG. 1 and 5A-5F). Excessive reaction pressures will cause downward motion of the seal plate (400) until the gap between the bottom surface of the reaction block (100) and top surface of the seal plate (400) becomes to great for the O-rings to seals (460) to close, and fluid will leak from the vessels through the gap (see COL. 60-67). Therefore, it would

have been obvious to one having ordinary skill in the art at the time the invention was made to have springs bias reaction vessels against the flow restriction device to impose an effective seal yet relieve excess pressure when necessary.

53. Claim 51 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,309,608 to Zhou et al.

Referring to claim 51, Zhou et al. disclose a small space or gap located between the top surface of the reaction block (100) and bottom surface of the cover plate (200) permits fluid communication between the gas and vapor space and reaction chambers (110), facilitating pressure equalization above, below, and within the chambers (see COL. 15, lines 56-67; COL. 16, lines 1-7). Clamping or closure means, typically screw or bolt-type fasteners passing through through-holes, provide an effective seal between the cover plate and reaction block to allow internal reaction block pressures as high as several atmospheres as necessary for particular reactions (see COL. 15, lines 21-32). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use fluid pressurized substantially above atmospheric pressure as necessary to perform synthesis or screening.

Double Patenting

54. Applicant is advised that should claim 25 be found allowable, claim 29 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to

object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elizabeth Quan whose telephone number is (703) 305-1947. The examiner can normally be reached on M-F (8:00-4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on (703) 308-4037. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1193.

Elizabeth Quan
Examiner
Art Unit 1743

eq
November 19, 2001

Jill Warden
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